

## CLAIMS

1. An air cleaning device, comprising: a body (1); a first filter unit (4); a photocatalyst reaction unit which generates spiral air current; a forcible convection unit (3) and a circuit control unit (5) which can adjustably control the operation of the forcible convection unit (3), wherein: the first filter unit (4) is disposed below the body (1) and has a front surface in shape of an opening so as to communicate with the outside and a rear surface in communication with an inlet port of the forcible convection unit (3), and the forcible convection unit (3) is disposed between the first filter unit (4) and the photocatalyst reaction unit so as to communicate the first filter unit (4) with the photocatalyst reaction unit, characterized in that:

the photocatalyst reaction unit includes an air duct (21), a photocatalyst coating layer (22) disposed on an interior wall of the air duct (21), two lamp holders (24), at least one ultra violet ray tube (23) mounted on the two lamp holders (24), and a blow guide holder (26) on which a spiral blow guide blade (25) is mounted,

wherein two ends of the air duct (21) are hermetically connected to left and right side plates of the body (1) respectively,

the air duct is provided at a left side thereof with an air inlet port which is in communication with the air outlet port of the forcible convection unit (3) in a tangential direction thereof;

two ends of each ultra violet ray tube (23) are mounted on the lamp holders (24) and axially disposed inside the air duct (21);

the blow guide holder (26) is provided on the left side plate and located at a position of the air inlet port of the air duct (21);

the blow guide holder (26) is provided at a right end thereof with a plurality of vent holes (28) which are formed and arranged in form of a loop; and

a vent opening (261) which is in communication with the vent holes is provided at a side wall of the blow guide holder (26).

2. The air cleaning device according to claim 1, characterized in that:

the air duct (21) is composed of two elongated housings each having a semi-circle section which can be abutted with each other, wherein each of the two semi-circle shaped

housings is provided at a lower left side thereof with a recess so that the two recesses of the two housings can be abutted with each other so as to form an air inlet port.

3. The air cleaning device according to claim 1 or 2, characterized in that:  
the interior wall of the air duct (21) is formed into an accidented surface with undulations, and

the photocatalyst coating layer (22) is coated onto the accidented surface of the interior wall of the air duct by a spraying or impregnating process.

4. The air cleaning device according to claim 1 or 2, characterized in that:  
the first filter unit (4) includes a dust blocking web (41) and a movable door (42) which are provided on a front housing (11) of the body (1), wherein:  
the dust blocking web (41) is a filter web made of active carbon or high-efficiency HEPA filtering materials or a combination thereof; and  
the movable door (42) is disposed on the front side of the dust blocking web (41) and provided with an air suction grill.

5. The air cleaning device according to claim 1 or 2, characterized in that:  
the forcible convection unit (3) is configured to be a blower consisting of a motor (31) which is provided between a front housing and a rear housing of the body (1) and connected to the circuit control unit (5), and a plurality of blades (32) which are mounted on a rotation shaft of the motor (31), wherein:  
an air inlet port of the blower is in communication with the first filter unit (4) and an air outlet port thereof is in communication with an air inlet port of the photocatalyst reaction unit.